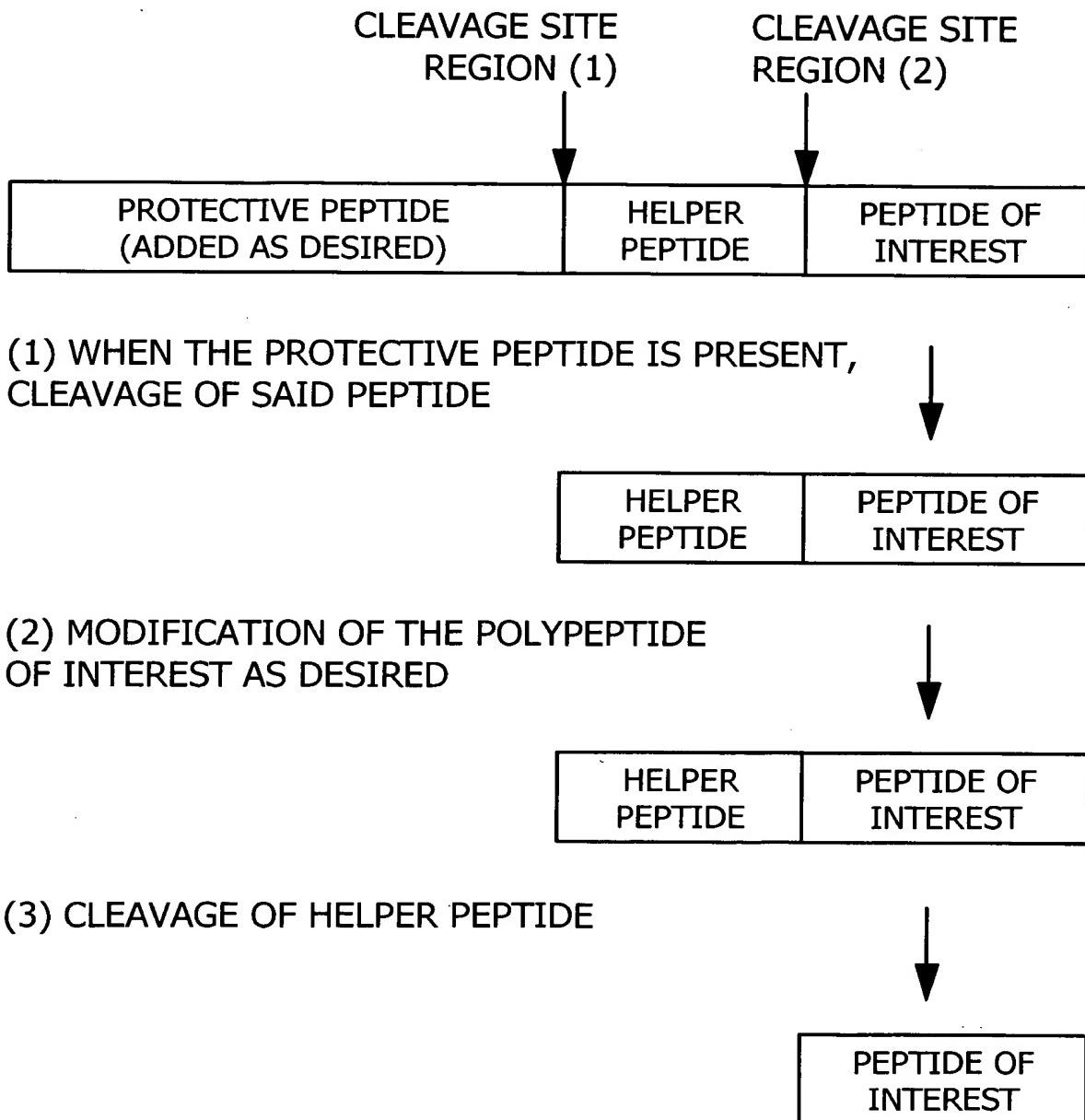


APPROVED	J. G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

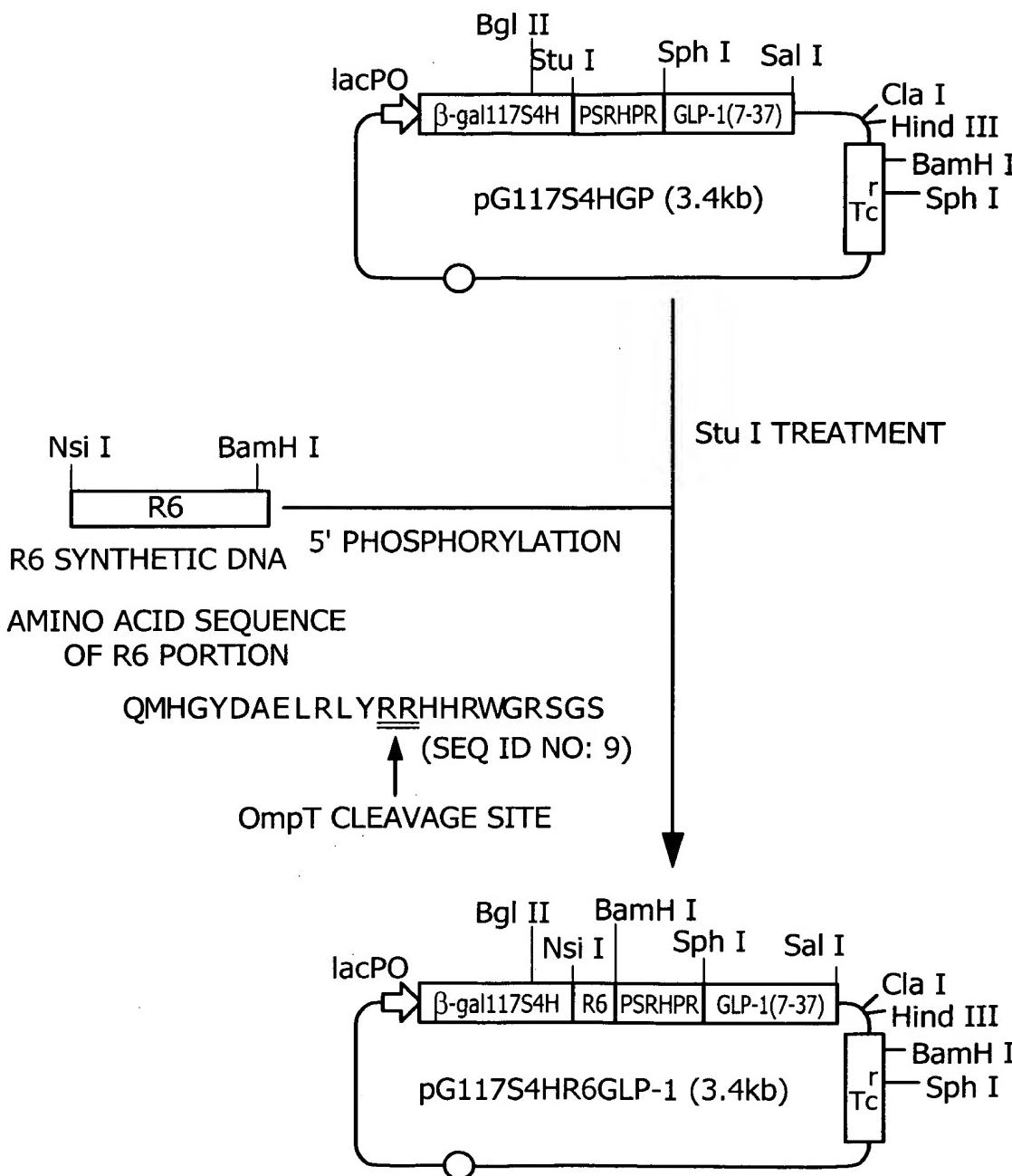
ATTN. FILING DATE: SEPTEMBER 29, 1999  
 TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
 PEPTIDE  
 INVENTOR(S): KAZUHIRO OHSUYE ET AL  
 APPLICATION SERIAL NO: 09/402,093

SHEET 1 of 24

## FIG. 1

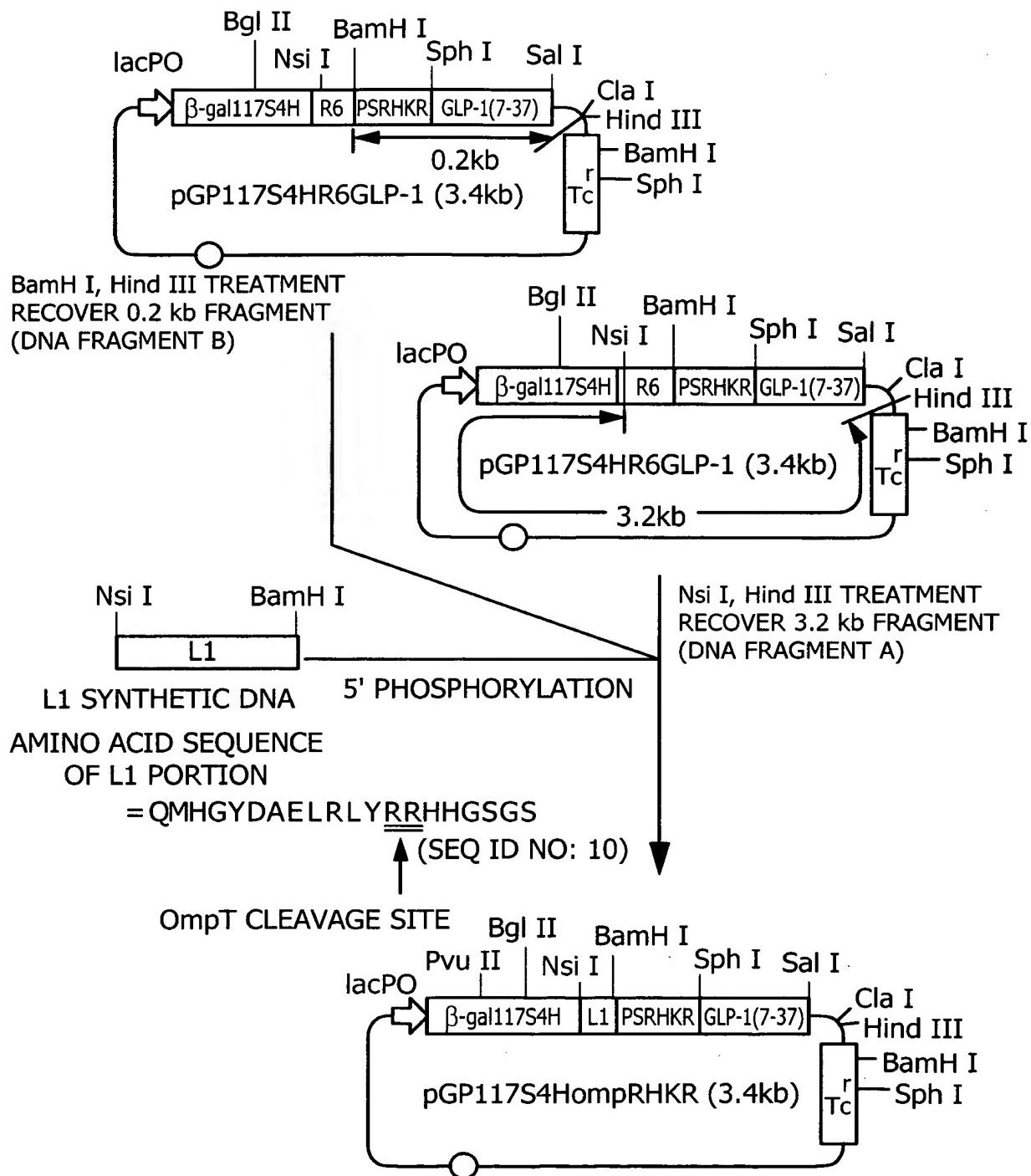


## FIG. 2



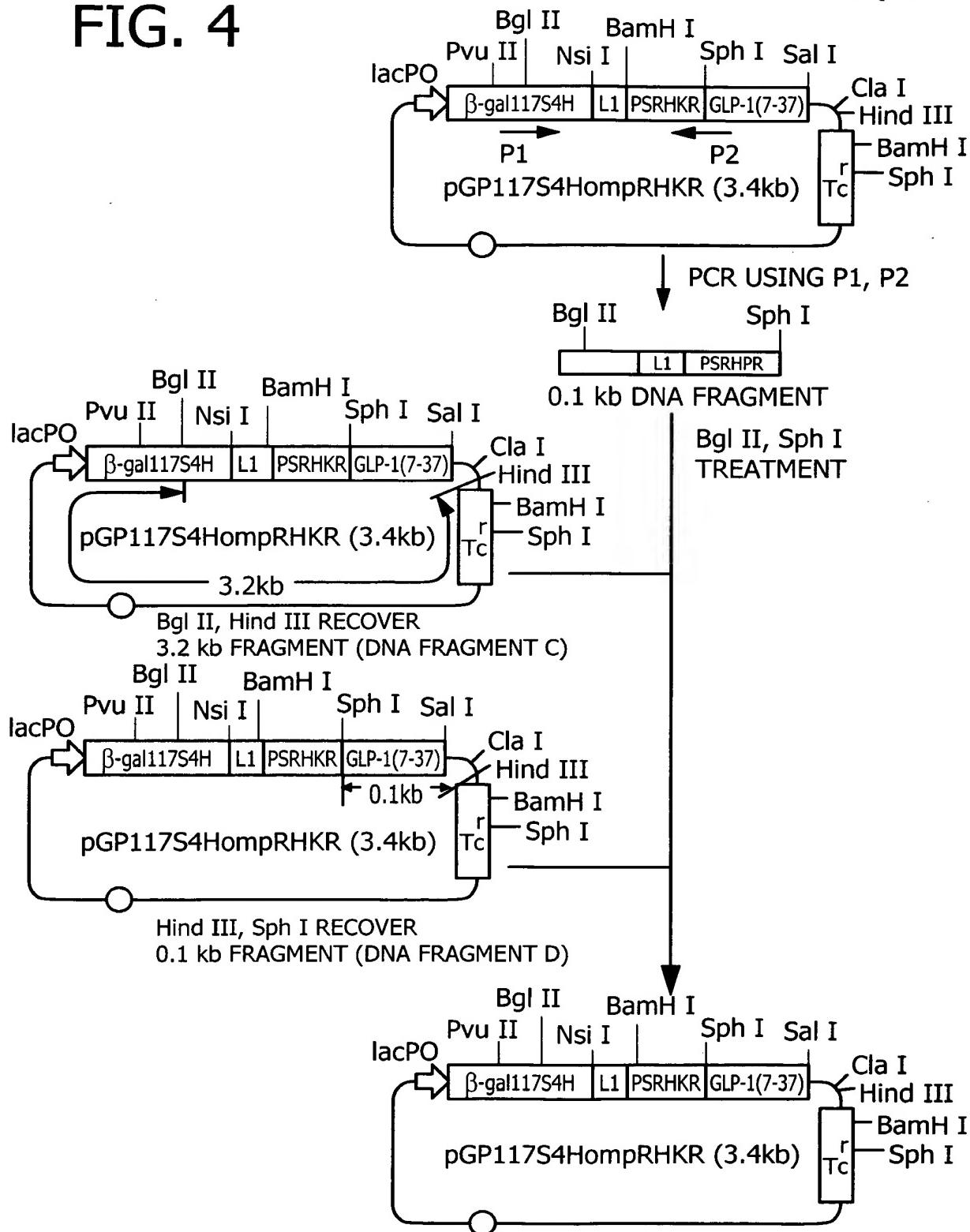
APPROVED	U.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

## FIG. 3



APPROVED	O.G. FIG.
BY	
DRAFTSMAN	

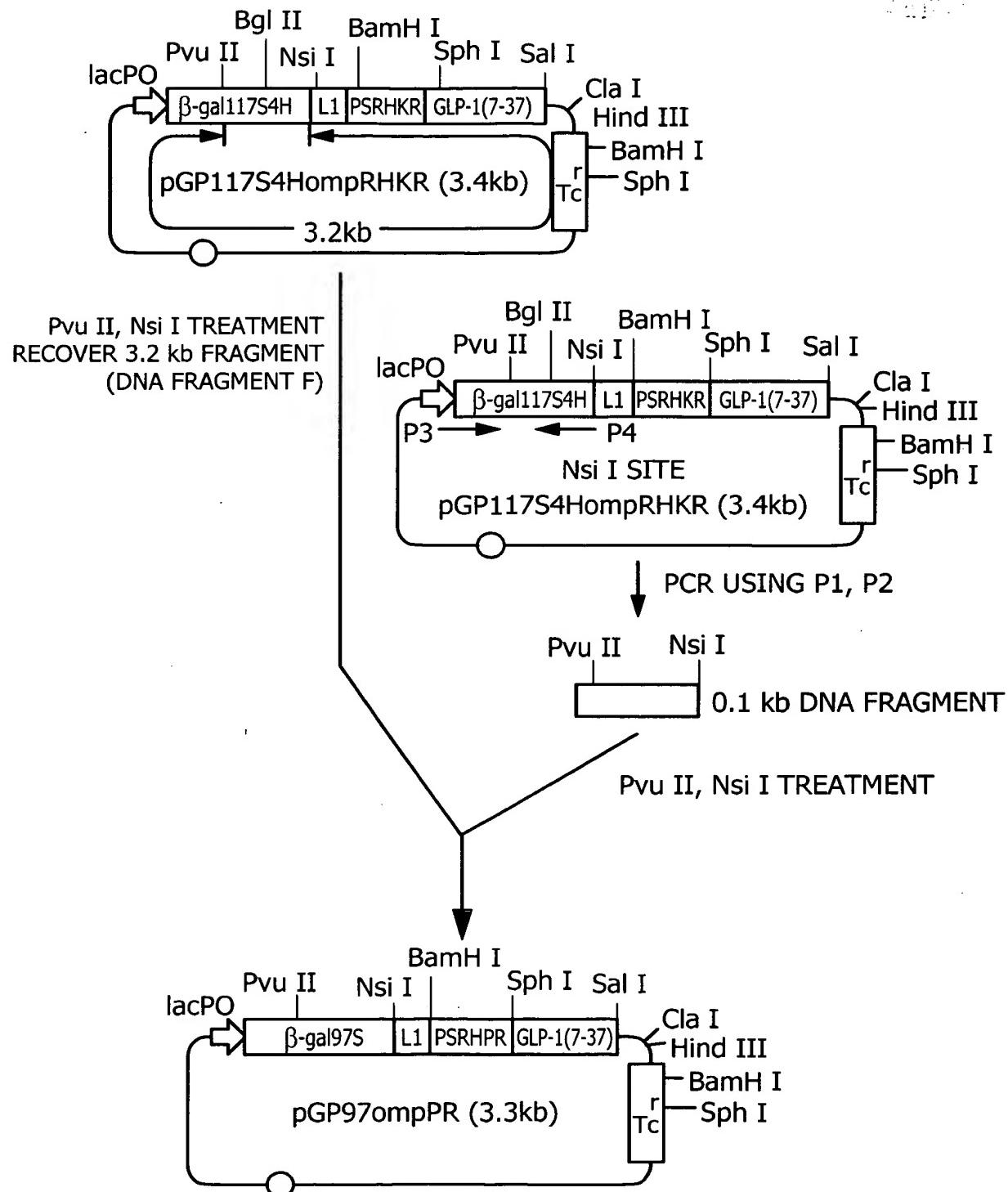
**FIG. 4**



APPROVED	O.G. FIG.
BY	CLASS
DRAFTSMAN	SUBCLASS

APPLN. FILING DATE: SEPTEMBER 29, 1999  
 TITLE: PROCESS FOR PRODUCING PEPTIDE USING A HELPER PEPTIDE  
 INVENTOR(S): KAZUHIRO OHSUYE ET AL  
 APPLICATION SERIAL NO: 09/402,093  
 SHEET 5 of 24

# FIG. 5



APPROVED	J.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
 TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER PEPTIDE  
 INVENTOR(S): KAZUHIRO OHSUYE ET AL  
 APPLICATION SERIAL NO: 09/402,093

SHEET 6 of 24

# FIG. 6

R6 SEQUENCE      CORRESPONDING AMINO ACID SEQUENCE

5' CAG ATG CAT GGT TAT GAC GCG GAG CTC CGG CTG TAT CGC CGT CAT CAC CGG  
 3' GTC TAC GTA CCA ATA CTG CGC CTC GAG GCC GAC ATA GCG GCA GTA GTG GCC  
 Gln Met His Gly Tyr Asp Ala Glu Leu Arg Leu Tyr Arg Arg His His Arg  
 (SEQ ID NO: 11) (SEQ ID NO: 12)

TGG GGT CGT TCC GGA TCC 3'  
 ACC CCA GCA AGG CCT AGG 5'  
 Trp Gly Arg Ser Gly Ser

L1 SEQUENCE      5' T GGT TAT GAC GCG GAG CTC CGG CTG TAT CGC CGT CAT CAC GGT TCC G 3' (SEQ ID NO: 13)  
 3' ACGTA CCA ATA CTG CGC CTC GAG GCC GAC ATA GCG GCA GTA GTG CCT AG 5' (SEQ ID NO: 14)

P1 PRIMER SEQUENCE      5' GAC TCA GAT CCT GAG GCC GAT 3' (SEQ ID NO: 15)

P2 PRIMER SEQUENCE      5' AAA GGT ACC TTC CGC ATG CGG ATG TCG AGA AGG 3' (SEQ ID NO: 16)

P3 PRIMER SEQUENCE      5' AGG CCA GGA ACC GTA AAA AG 3' (SEQ ID NO: 17)

P4 PRIMER SEQUENCE      5' AAA ATG CAT CGC ATC GTA ACC GTG CAT CT 3' (SEQ ID NO: 18)

APPROVED	U.G. FIG:	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
 TITLE: PROCESS FOR PRODUCING PEPTIDES, HAVING A HELPER  
 PEPTIDE  
 INVENTOR(S): KAZUHIRO OHSUYE ET AL  
 APPLICATION SERIAL NO: 09/402,093  
 SHEET 7 of 24

## FIG. 7

Met	Thr	Met	Ile	Thr	Asp	Ser	Leu	Ala	Val	Val	Leu	Gln	Arg	Lys	15
Asp	Trp	Asp	Asn	Pro	Gly	Val	Thr	Gln	Leu	Asn	Arg	Leu	Ala	Ala	30
His	Pro	Pro	Phe	Ala	Ser	Trp	Arg	Asn	Ser	Asp	Asp	Ala	Arg	Thr	45
Asp	Arg	Pro	Ser	Gln	Gln	Leu	Arg	Ser	Leu	Asn	Gly	Glu	Trp	Arg	60
Phe	Ala	Trp	Phe	Pro	Ala	Pro	Glu	Ala	Val	Pro	Ala	Ser	Leu	Leu	75
Glu	Ser	Asp	Leu	Pro	Glu	Ala	Asp	Thr	Val	Val	Val	Pro	Ser	Asn	90
Trp	Gln	Met	His	Gly	Tyr	Asp	Ala	Met	His	Gly	Tyr	Asp	Ala	Glu	105
Leu	Arg	Leu	Tyr	Arg	<u>Arg</u>	<u>His</u>	<u>His</u>	<u>Gly</u>	<u>Ser</u>	<u>Gly</u>	<u>Ser</u>	<u>Pro</u>	<u>Ser</u>	<u>Arg</u>	120
His	Pro	Arg	<u>His</u>	<u>Ala</u>	<u>Glu</u>	<u>Gly</u>	<u>Thr</u>	<u>Phe</u>	<u>Thr</u>	<u>Ser</u>	<u>Asp</u>	<u>Val</u>	<u>Ser</u>	<u>Ser</u>	135
Tyr	Leu	Glu	Gly	Gln	Ala	Ala	Lys	Glu	Phe	Ile	Ala	Trp	Leu	Val	150
Lys	Gly	Arg	Gly												
154															

(SEQ ID NO: 20)  
 AMINO ACID SEQUENCE OF FUSION PROTEIN (GP97ompPR)  
 ENCODED BY pGP97ompPR

APPROVED	D.G. FIG.	
BY	CLASS	SUBCLASS
DRAFPSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
 TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
 PEPTIDE  
 INVENTOR(S): KAZUHIRO OHSUYE ET AL  
 APPLICATION SERIAL NO: 09/402,093  
 SHEET 8 of 24

# FIG. 8

lac PO

CCCAGGCTTACACTTATGCTTCGGCTCGTATGTTGTGGAATTGTGAGCG

1

GATAACAATTCACACAGGAAACAGCT ATG ACC XXX ATT ACG GAT TCA CTG GCC  
 Met Thr Met Ile Thr Asp Ser Leu Ala

GTC GTT TTA CAA CGT AAA GAC TGG GAT AAC CCT GGC GTT ACC CAA CTT  
 Val Val Leu Gln Arg Lys Asp Trp Asp Asn Pro Gly Val Thr Gln Leu

AAT CGC CTT GCA GCA CAT CCC CCT TTC GCC AGC TGG CGT AAT AGC GAC  
 Asn Arg Leu Ala Ala His Pro Pro Phe Ala Ser Trp Arg Asn Ser Asp

GAC GCC CGC ACC GAT CGC CCT TCC CAA CAG TTG CGC AGC CTG AAT GGC  
 Asp Ala Arg Thr Asp Arg Pro Ser Gln Gln Leu Arg Ser Leu Asn Gly

GAA TGG CGC TTT GCC TGG TTT CCG GCA CCA GAA GCG GTG CCG GCA AGC  
 Glu Trp Arg Phe Ala Trp Phe Pro Ala Pro Glu Ala Val Pro Ala Ser

TTG CTG GAG TCA GAT CTT CCT GAG GCC GAT ACT GTC GTC GTC CCC TCA  
 Leu Leu Glu Ser Asp Leu Pro Glu Ala Asp Thr Val Val Val Pro Ser

AAC TGG CAG ATG CAC GGT TAC GAT GCG ATG CAT GGT TAT GAC GCG GAG  
 Asn Trp Gln Met His Gly Tyr Asp Ala Met His Gly Tyr Asp Ala Glu

CTC CGC CTG TAT CGC CGT CAT CAC GGT TCC GGA TCC CCT TCT CGA CAT  
 Leu Arg Leu Tyr Arg Arg His His Gly Ser Gly Ser Pro Ser Arg His

CCG CGG CAT GCG GAA GGT ACC TTT ACC AGC GAT GTG AGC TCG TAT CTG  
 Pro Arg His Ala Glu Gly Thr Phe Thr Ser Asp Val Ser Ser Tyr Leu

GAA GGT CAG GCG GCA AAA GAA TTC ATC GCG TGG CTG GTG AAA GGC CGT  
 Glu Gly Gln Ala Ala Lys Glu Phe Ile Ala Trp Leu Val Lys Gly Arg

462

GGT TAA GTCGAC AGCCCGCTAATGAGCGGGCTTTTTCTCGGAATTCTCATGT  
 Gly \*\*\*

STOP CODON

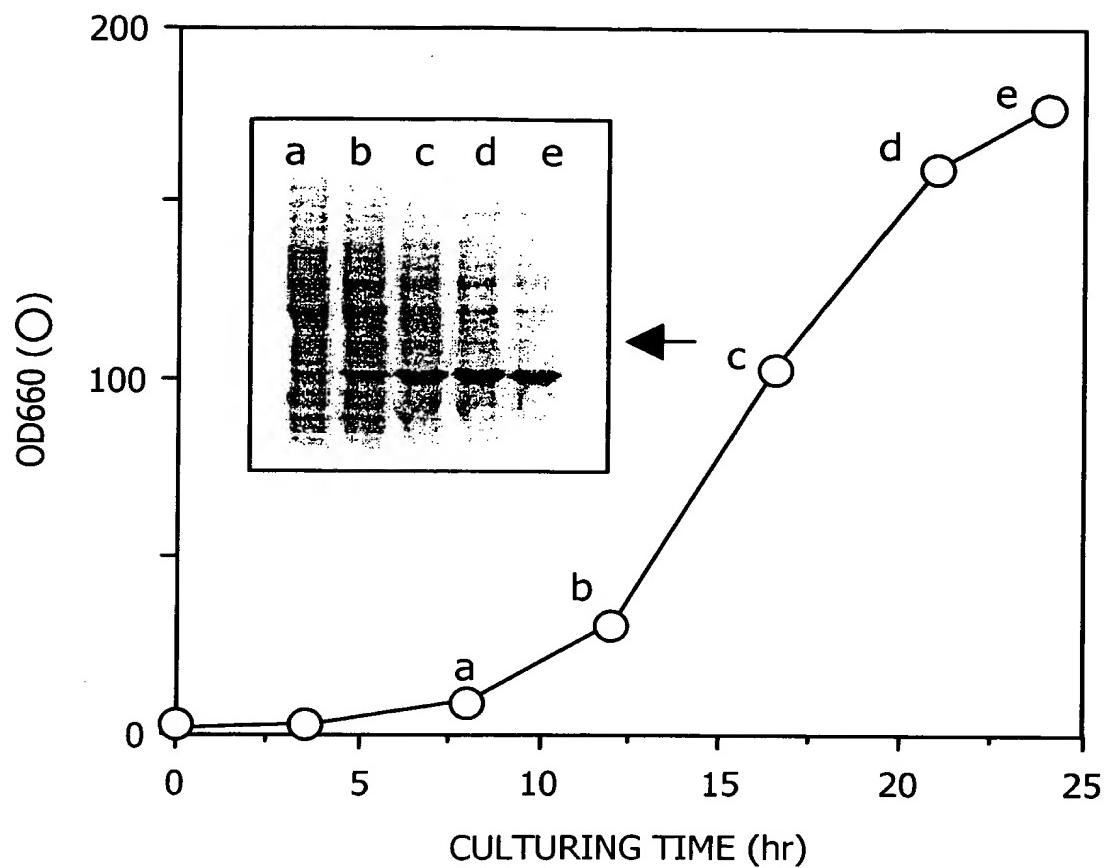
TTGACAGCTTATCATCGATAAGCTTTA

(SEQ ID NO: 19)

APPROVED	C.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093  
SHEET 9 of 24

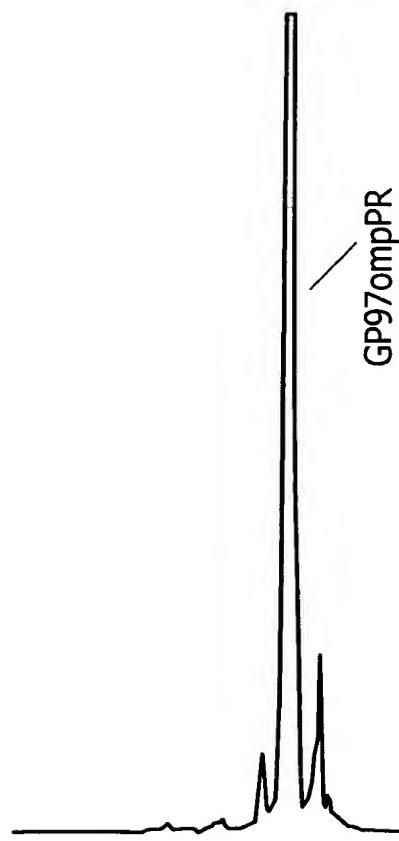
FIG. 9



APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093      SHEET 10 of 24

BEFORE REACTION



AFTER REACTION

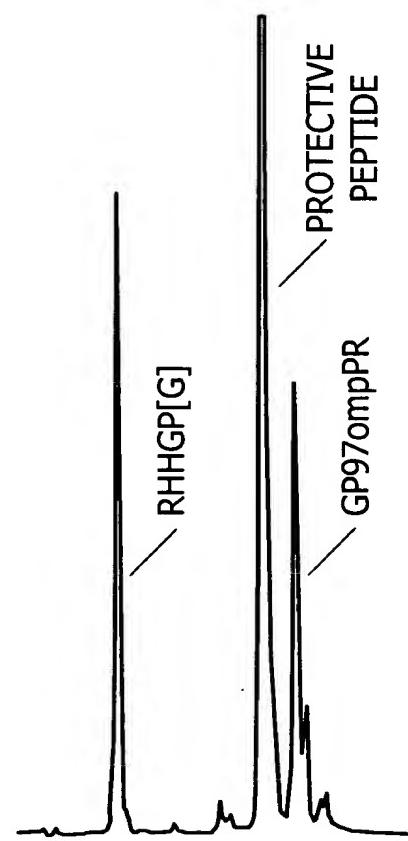


FIG. 10A

FIG. 10B

APPROVED	U.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
 TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
 PEPTIDE  
 INVENTOR(S): KAZUHIRO OHSUYE ET AL  
 APPLICATION SERIAL NO: 09/402,093      SHEET 11 of 24

## FIG. 11

Met	Thr	Met	Ile	Thr	Asp	Ser	Leu	Ala	Val	Val	Leu	Gln	Arg	15
Asp	Trp	Asp	Asn	Pro	Gly	Val	Thr	Gln	Leu	Asn	Arg	Leu	Ala	30
His	Pro	Pro	Phe	Ala	Ser	Trp	Arg	Asn	Ser	Asp	Asp	Ala	Arg	45
Asp	Arg	Pro	Ser	Gln	Gln	Leu	Arg	Ser	Leu	Asn	Gly	Glu	Trp	60
Phe	Ala	Trp	Phe	Pro	Ala	Pro	Glu	Ala	Val	Pro	Ala	Ser	Leu	Leu
Glu	Ser	Asp	Leu	Pro	Glu	Ala	Asp	Thr	Val	Val	Val	Pro	Ser	Asn
Trp	Gln	Met	His	Gly	Tyr	Asp	Ala	Pro	Ile	Tyr	Thr	Asn	Val	105
Tyr	Pro	Ile	Thr	Val	Asn	Pro	Pro	Phe	Val	Pro	Thr	Glu	Pro	His
His	His	His	His	Gly	Gly	Arg	Gln	Met	His	Gly	Tyr	Asp	Ala	135
Leu	Arg	Leu	Tyr	Arg	<u>Arg</u>	<u>His</u>	<u>His</u>	<u>Arg</u>	Trp	Gly	Arg	Ser	Gly	150
Pro	Ser	Arg	His	Lys	<u>Arg</u>	<u>His</u>	<u>His</u>	<u>Arg</u>						165
Val	Ser	Ser	Tyr	Leu	Glu	Gly	Gln	Ala	Ala	Lys	Glu	Phe	Ile	Ala
Trp	Leu	Val	Lys	Gly	Arg	Gly								180

(SEQ ID NO: 21)  
 AMINO ACID SEQUENCE OF FUSION PROTEIN  
 ENCODED BY pG117S4HR6GLP-1

APPROVED BY DRAFTSMAN	O.G. FIG.
	CLASS    SUBCLASS

## FIG. 12

Met	Thr	Met	Ile	Thr	Asp	Ser	Leu	Ala	Val	Val	Leu	Gln	Arg	15
Asp	Trp	Asp	Asn	Pro	Gly	Val	Thr	Gln	Leu	Asn	Arg	Leu	Ala	30
His	Pro	Pro	Phe	Ala	Ser	Trp	Arg	Asn	Ser	Asp	Asp	Ala	Arg	45
Asp	Arg	Pro	Ser	Gln	Gln	Leu	Arg	Ser	Leu	Asn	Gly	Glu	Trp	60
Phe	Ala	Trp	Phe	Pro	Ala	Pro	Glu	Ala	Val	Pro	Ala	Ser	Leu	Leu
Glu	Ser	Asp	Leu	Pro	Glu	Ala	Asp	Thr	Val	Val	Val	Pro	Ser	Asn
Trp	Gln	Met	His	Gly	Tyr	Asp	Ala	Pro	Ile	Tyr	Thr	Asn	Val	105
Tyr	Pro	Ile	Thr	Val	Asn	Pro	Pro	Phe	Val	Pro	Thr	Glu	Pro	His
His	His	His	His	Gly	Gly	Arg	Gln	Met	His	Gly	Tyr	Asp	Ala	135
Leu	Arg	Leu	Tyr	Arg	<u>Arg</u>	<u>His</u>	<u>His</u>	<u>Gly</u>	<u>Ser</u>	<u>Gly</u>	<u>Ser</u>	<u>Pro</u>	<u>Ser</u>	Glut
<u>His</u>	<u>Lys</u>	<u>Arg</u>	<u>His</u>	<u>Ala</u>	<u>Glu</u>	<u>Gly</u>	<u>Thr</u>	<u>Phe</u>	<u>Thr</u>	<u>Ser</u>	<u>Asp</u>	<u>Val</u>	<u>Ser</u>	150
<u>Tyr</u>	<u>Leu</u>	<u>Glu</u>	<u>Gly</u>	<u>Gln</u>	<u>Ala</u>	<u>Ala</u>	<u>Lys</u>	<u>Glu</u>	<u>Phe</u>	<u>Ile</u>	<u>Ala</u>	<u>Trp</u>	<u>Leu</u>	165
<u>Lys</u>	<u>Gly</u>	<u>Arg</u>	<u>Gly</u>											Ser

(SEQ ID NO: 22)  
 AMINO ACID SEQUENCE OF FUSION PROTEIN  
 ENCODED BY pG117S4HompRHKR

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

## FIG. 13

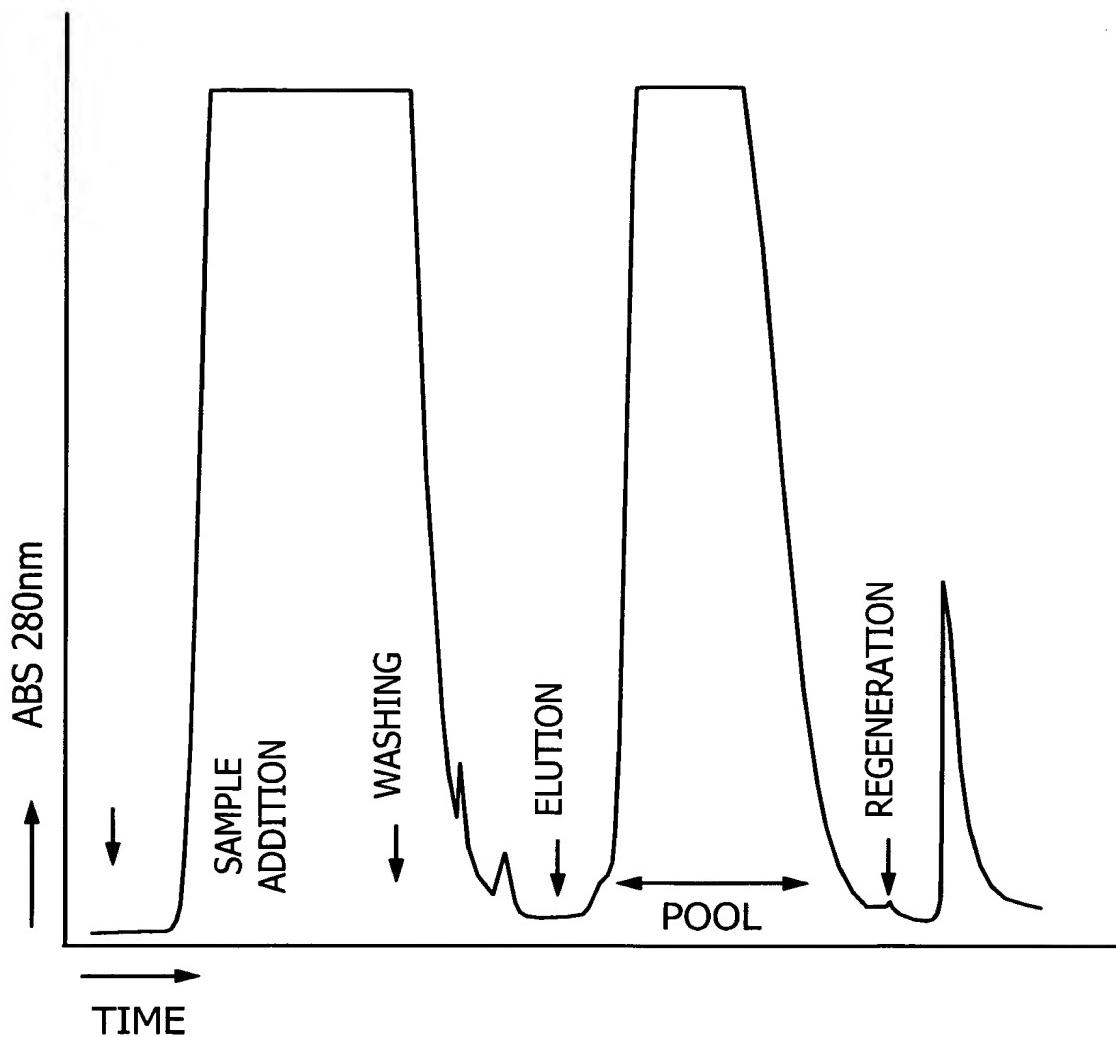
Met	Thr	Met	Ile	Thr	Asp	Ser	Leu	Ala	Val	Val	Leu	Gln	Arg	15
Asp	Trp	Asp	Asn	Pro	Gly	Val	Thr	Gln	Leu	Asn	Arg	Leu	Ala	30
His	Pro	Pro	Phe	Ala	Ser	Trp	Arg	Asn	Ser	Asp	Asp	Ala	Arg	45
Asp	Arg	Pro	Ser	Gln	Gln	Leu	Arg	Ser	Leu	Asn	Gly	Glu	Trp	60
Phe	Ala	Trp	Phe	Pro	Ala	Pro	Glu	Ala	Val	Pro	Ala	Ser	Leu	Leu
Glu	Ser	Asp	Leu	Pro	Glu	Ala	Asp	Thr	Val	Val	Val	Pro	Ser	Asn
Trp	Gln	Met	His	Gly	Tyr	Asp	Ala	Pro	Ile	Tyr	Thr	Asn	Val	105
Tyr	Pro	Ile	Thr	Val	Asn	Pro	Pro	Phe	Val	Pro	Thr	Glu	Pro	His
His	His	His	His	Gly	Gly	Arg	Gln	Met	His	Gly	Tyr	Asp	Ala	135
Leu	Arg	Leu	Tyr	Arg	<u>Arg</u>	<u>His</u>	<u>His</u>	<u>Gly</u>	<u>Ser</u>	<u>Gly</u>	<u>Ser</u>	<u>Pro</u>	<u>Ser</u>	Glu
<u>His</u>	<u>Pro</u>	<u>Arg</u>	<u>His</u>	<u>Ala</u>	<u>Glu</u>	<u>Gly</u>	<u>Thr</u>	<u>Phe</u>	<u>Thr</u>	<u>Ser</u>	<u>Asp</u>	<u>Val</u>	<u>Ser</u>	150
<u>Tyr</u>	<u>Leu</u>	<u>Glu</u>	<u>Gly</u>	<u>Gln</u>	<u>Ala</u>	<u>Ala</u>	<u>Lys</u>	<u>Glu</u>	<u>Phe</u>	<u>Ile</u>	<u>Ala</u>	<u>Trp</u>	<u>Leu</u>	165
<u>Lys</u>	<u>Gly</u>	<u>Arg</u>	<u>Gly</u>											180

(SEQ ID NO: 23)  
 AMINO ACID SEQUENCE OF FUSION PROTEIN  
 ENCODED BY pG117S4HomprRHPR

APPROVED	O.G. FIG.
BY	CLASS
DRAFTER	SUBCLASS

APPLN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093      SHEET 14 of 24

FIG. 14



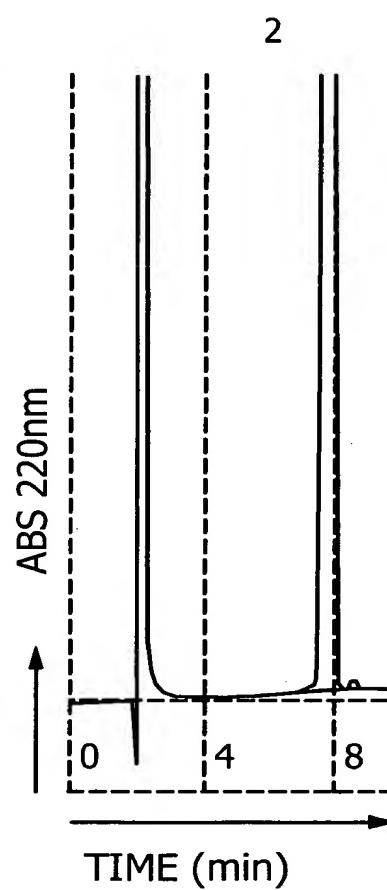
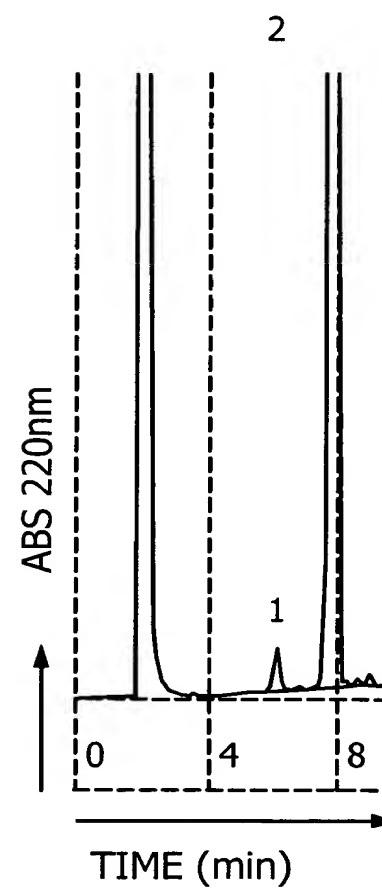
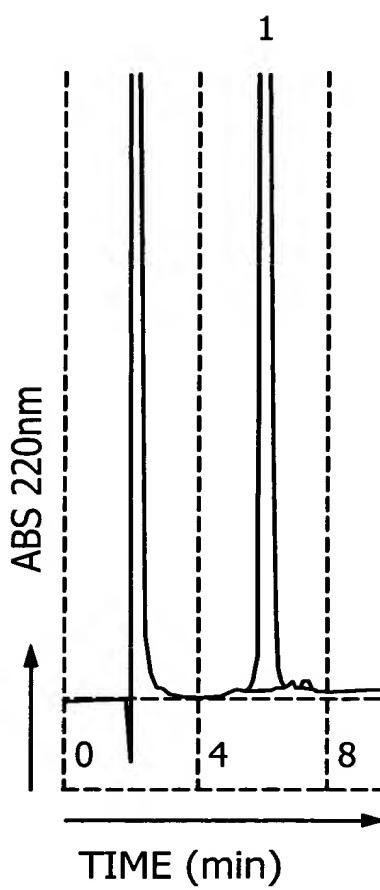
APPROVED	J.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093      SHEET 15 of 24

FIG. 15A

FIG. 15B

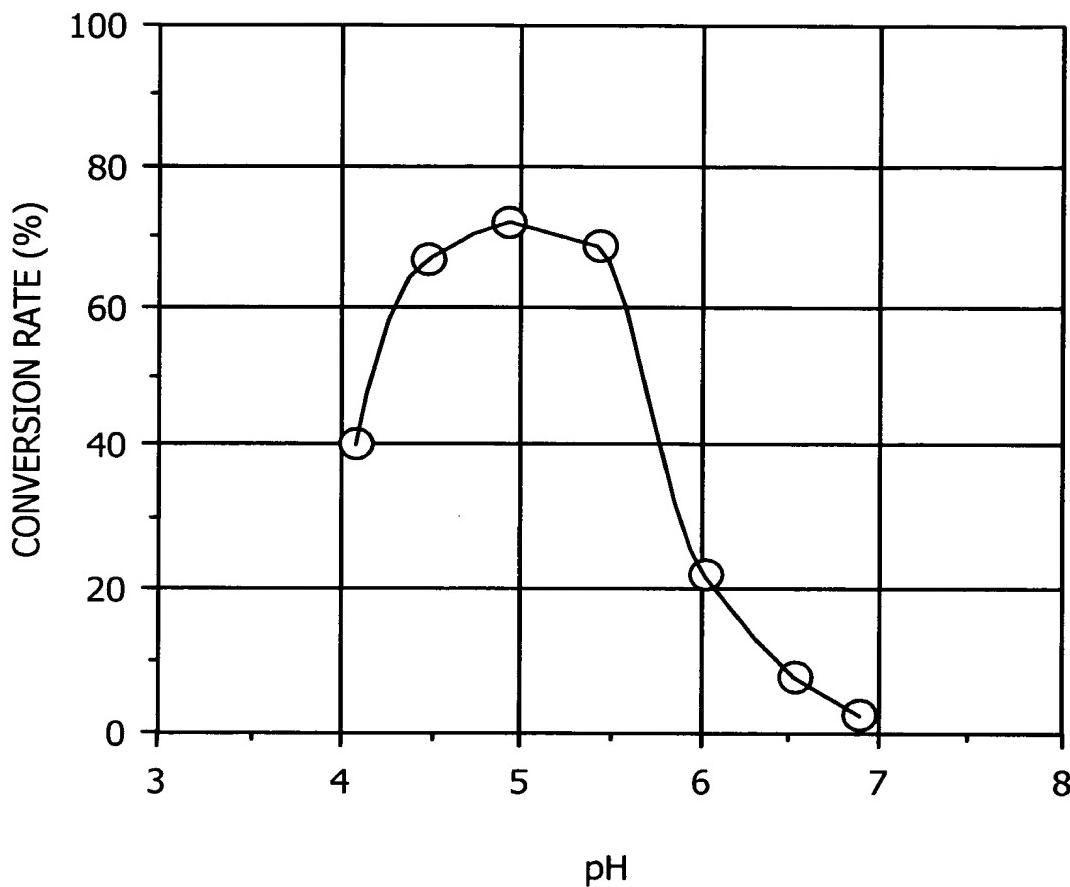
FIG. 15C



APPROVED	D.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093 SHEET 16 of 24

# FIG. 16



APPROVED	O.G. FIG.
BY	CLASS SUBCLASS
DRAFTSMAN	

APPN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093 SHEET 17 of 24

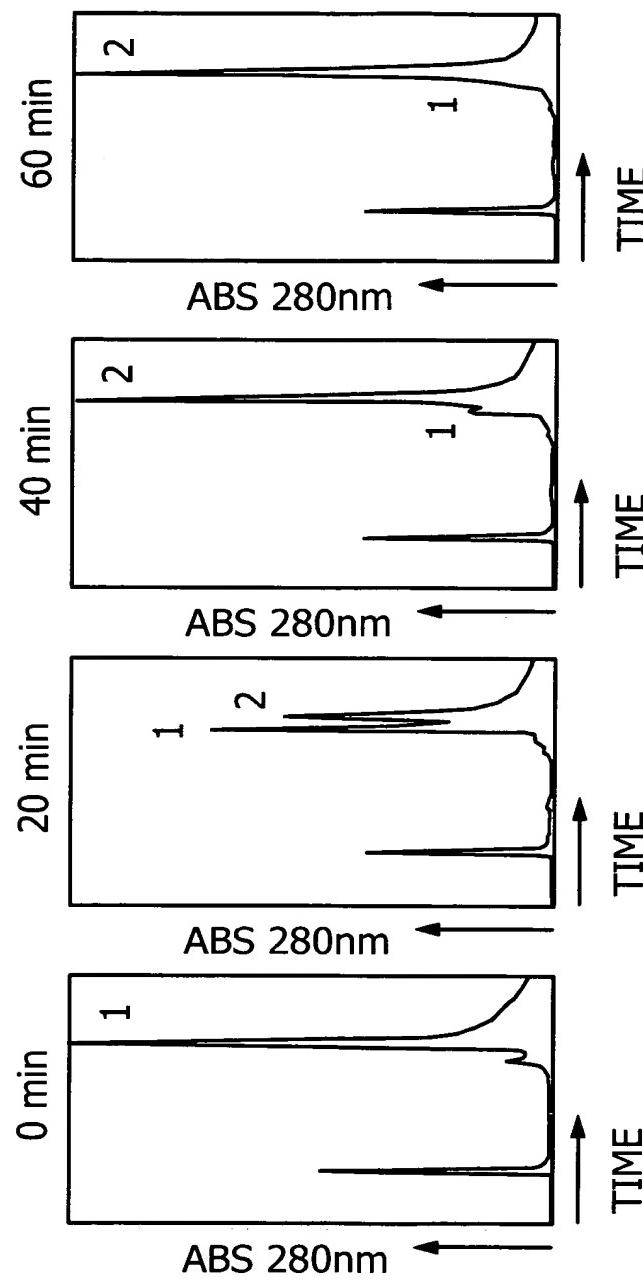
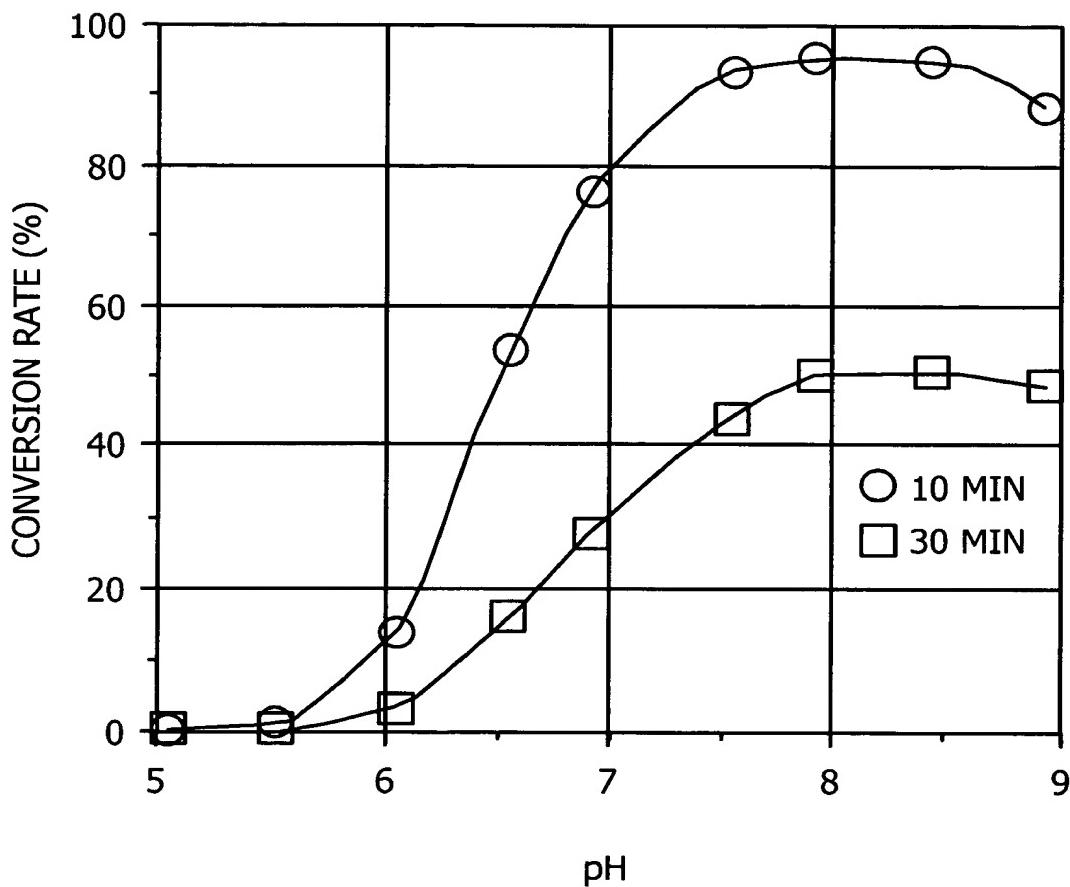


FIG. 17

APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

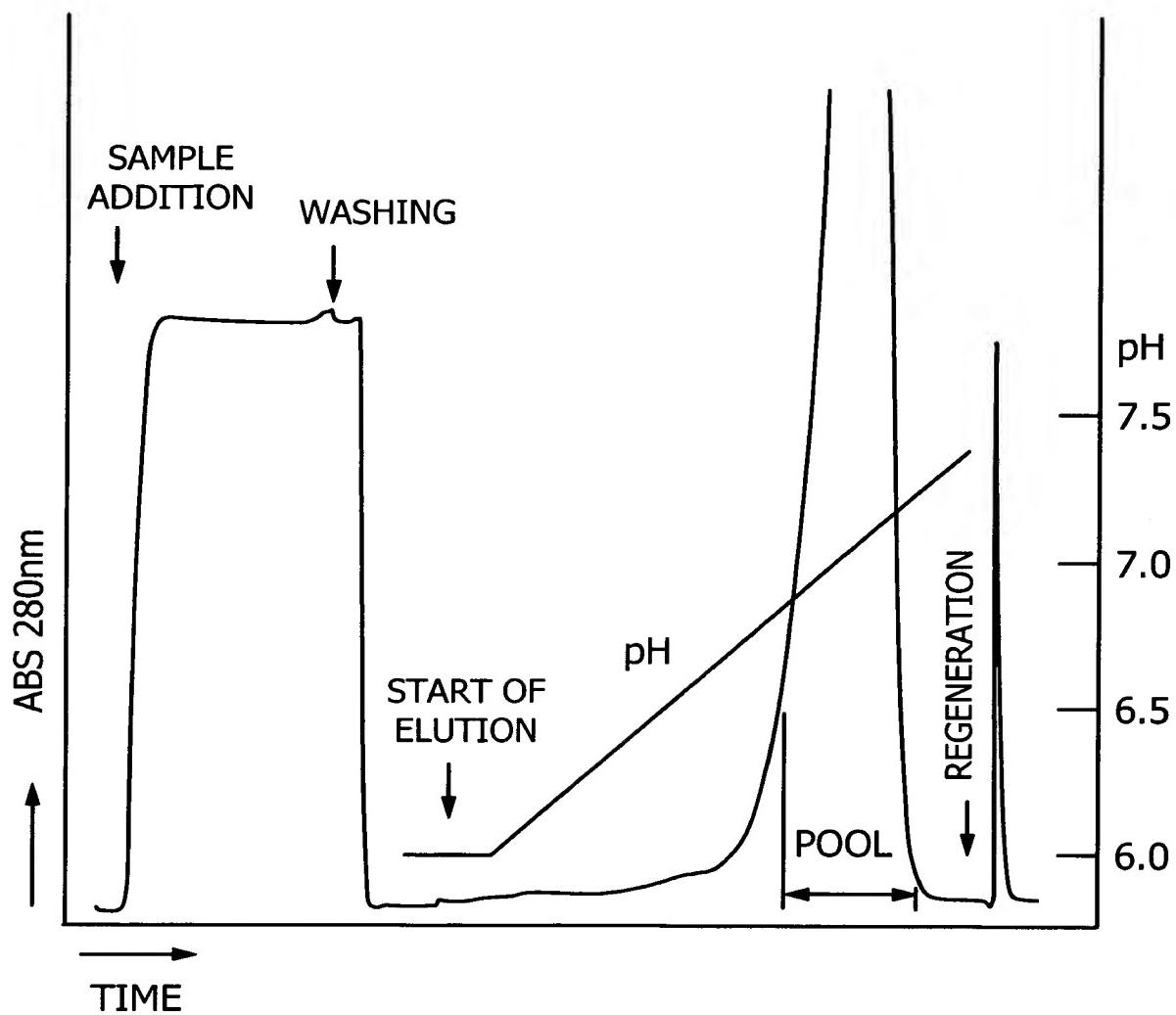
APPLN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093  
SHEET 18 of 24

## FIG. 18



APPROVED	J. G. FIG.	
BY	CLASS	SUBCLASS
DRAFSMAN		

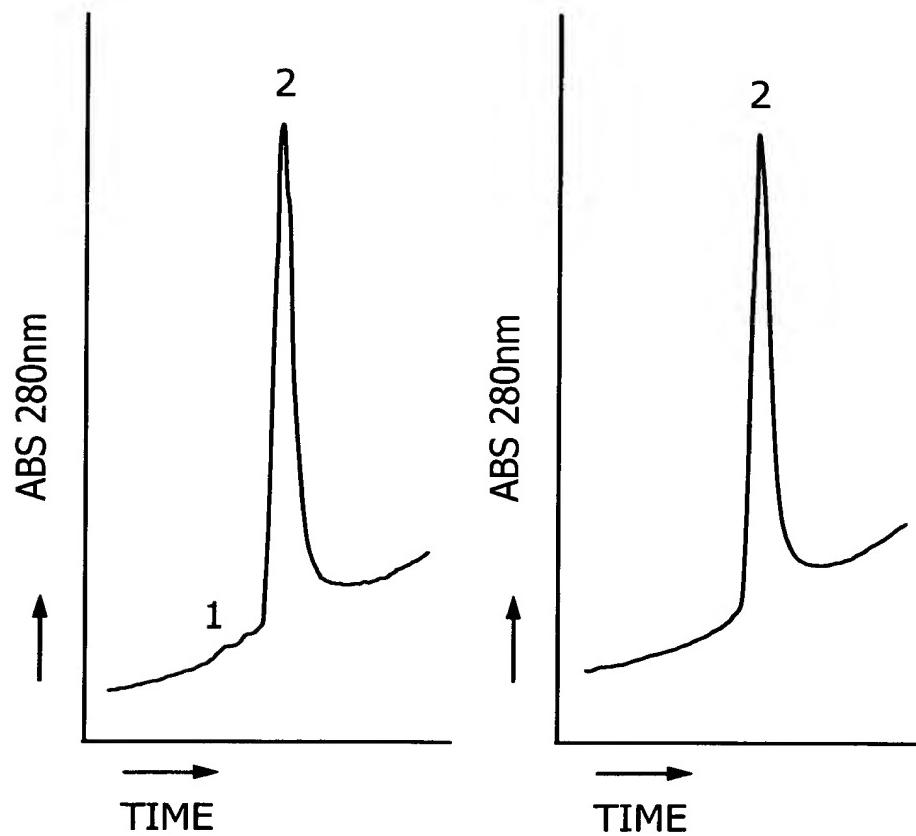
**FIG. 19**



APPROVED	U.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDE USING A HELPER  
PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093 SHEET 20 of 24

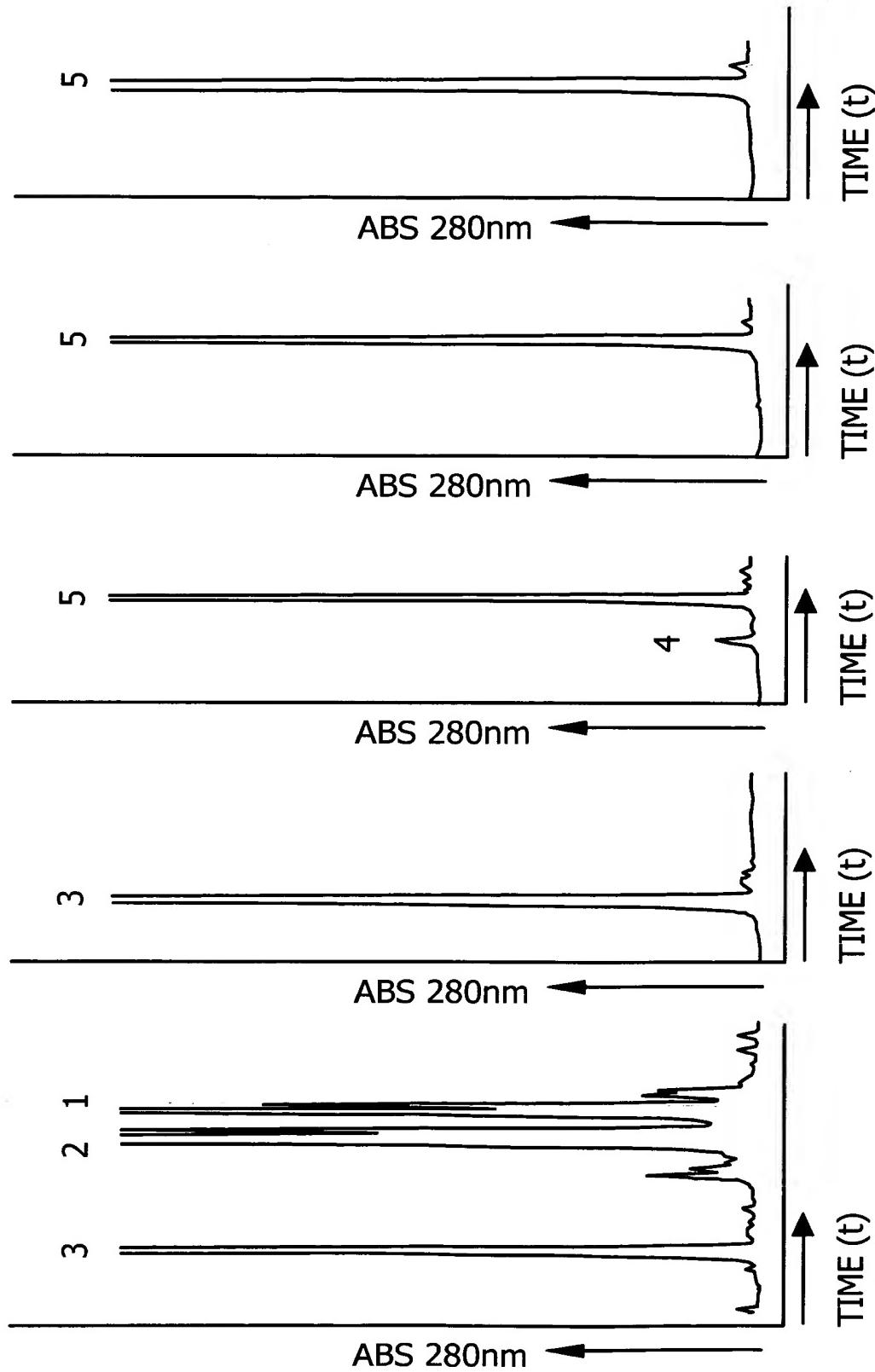
FIG. 20A    FIG. 20B



APPROVED	O. G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPN. FILING DATE: SEPTEMBER 29, 1999  
TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
PEPTIDE  
INVENTOR(S): KAZUHIRO OHSUYE ET AL  
APPLICATION SERIAL NO: 09/402,093 SHEET 21 of 24

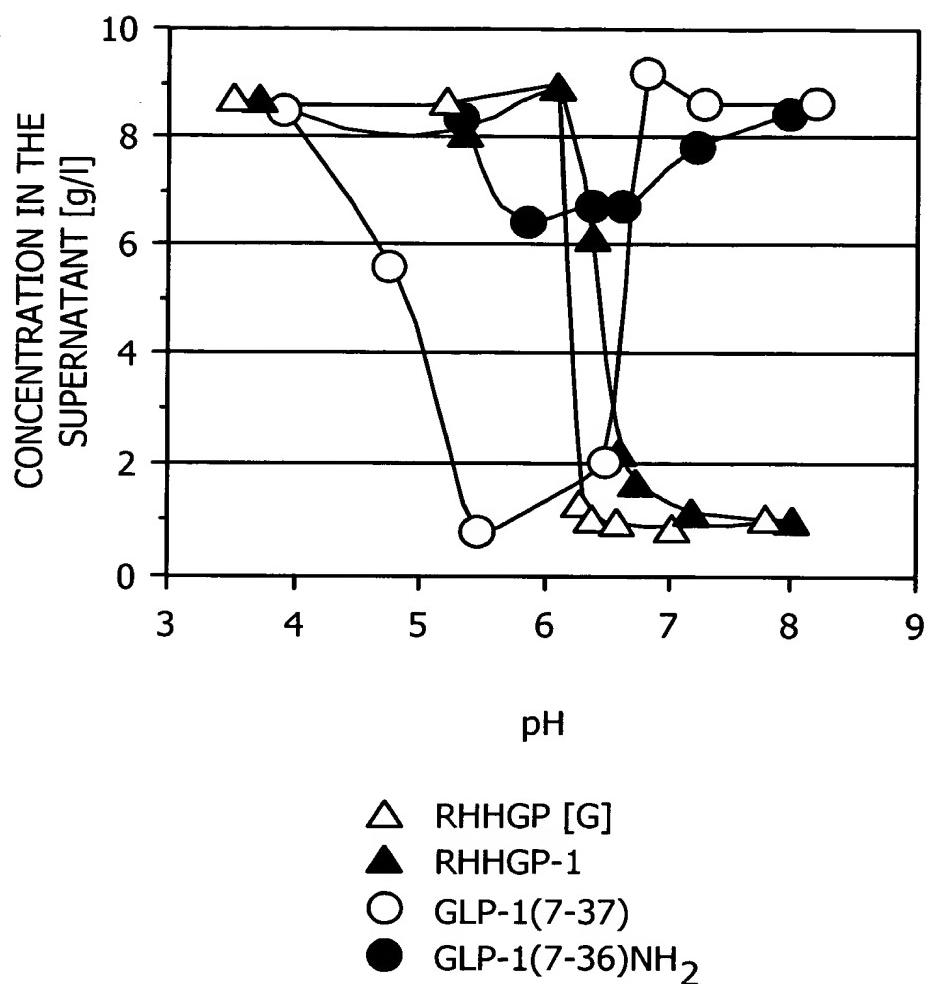
FIG. 21A FIG. 21B FIG. 21C FIG. 21D FIG. 21E



APPROVED	O.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

APPLN. FILING DATE: SEPTEMBER 29, 1999  
 TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
 PEPTIDE  
 INVENTOR(S): KAZUHIRO OHSUYE ET AL  
 APPLICATION SERIAL NO: 09/402,093      SHEET 22 of 24

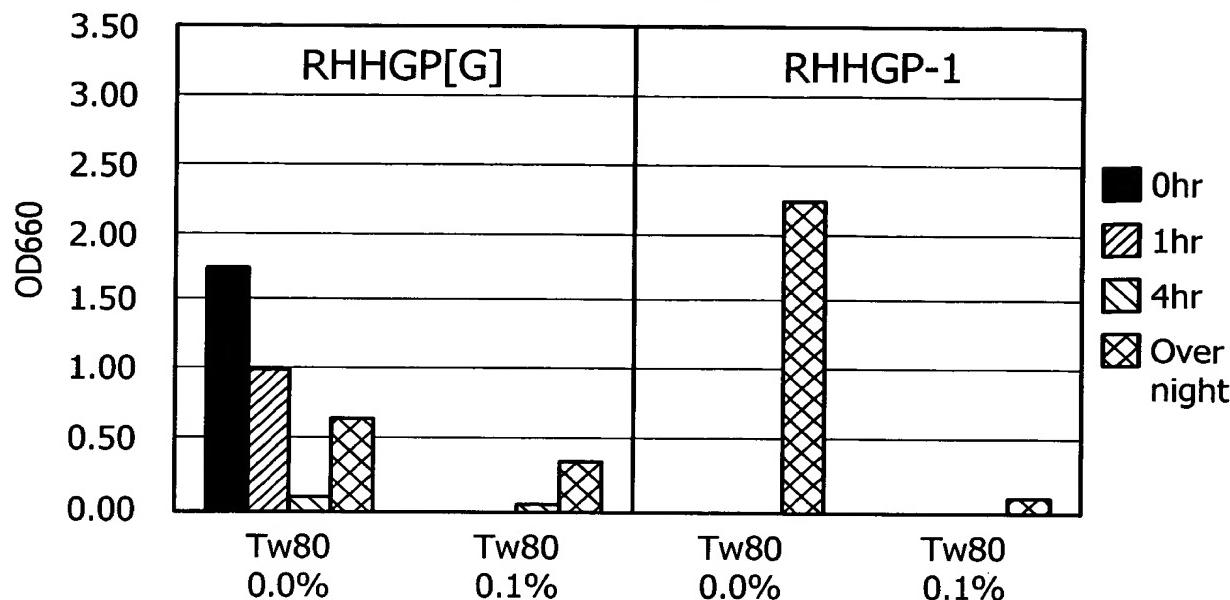
# FIG. 22



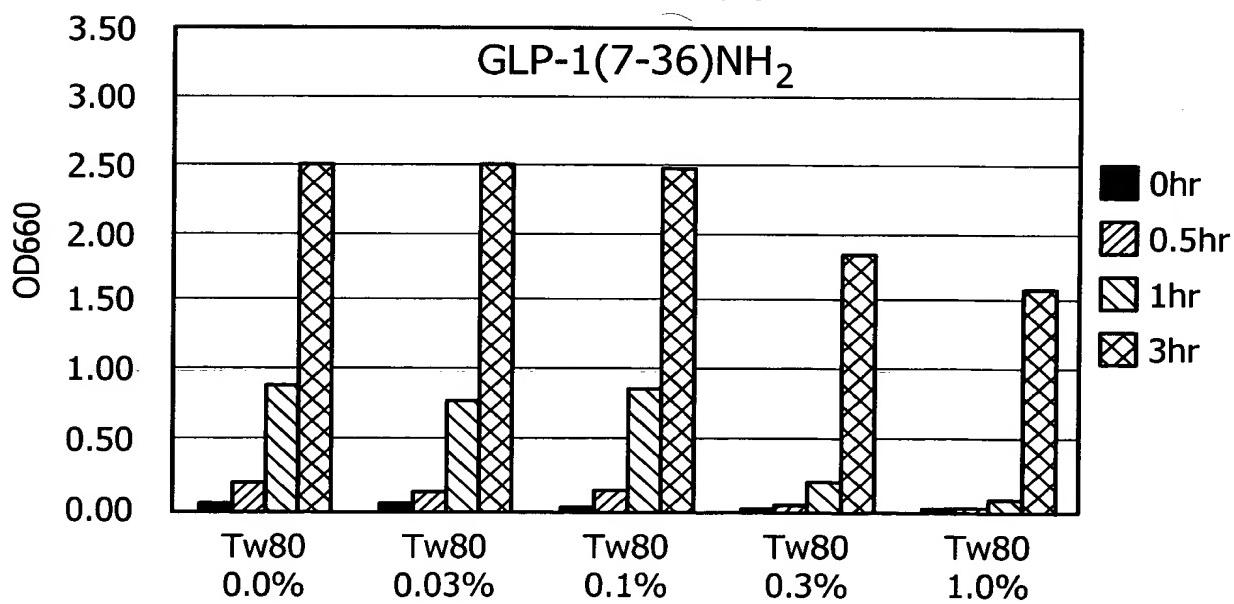
APPROVED BY	O.G. FIG.
CLASS	SUBCLASS
DRAFTER	

APPLN. FILING DATE: SEPTEMBER 29, 1999  
 TITLE: PROCESS FOR PRODUCING PEPTIDES USING A HELPER  
 PEPTIDE  
 INVENTOR(S): KAZUHIRO OHSUYE ET AL  
 APPLICATION SERIAL NO: 09/402,093      SHEET 23 of 24

**FIG. 23A**  
**TWEEN80**



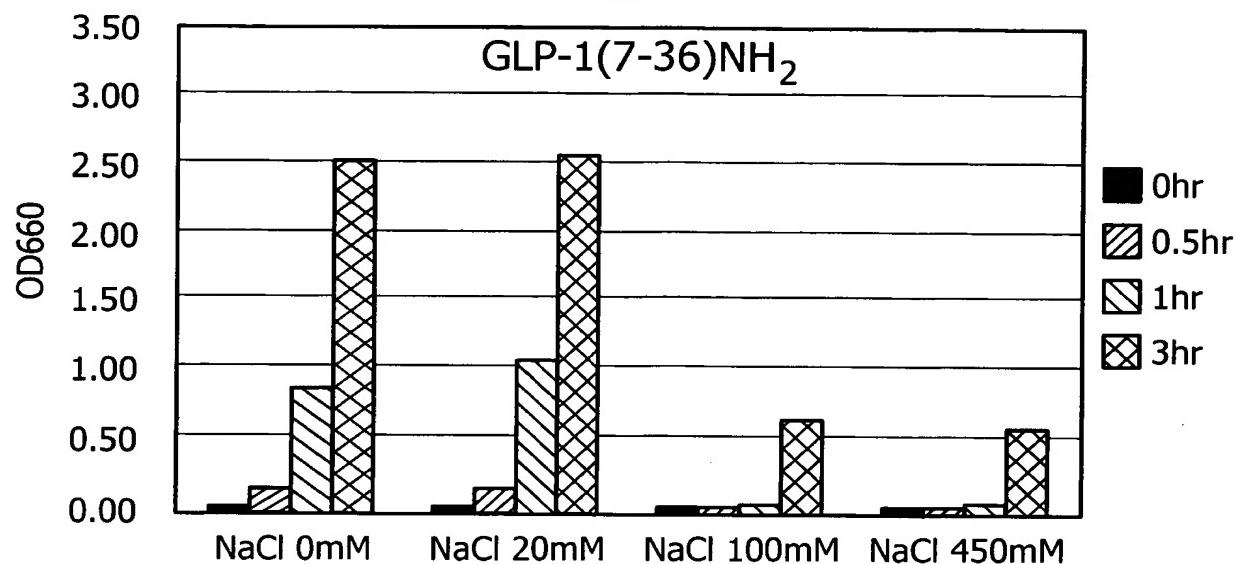
**FIG. 23B**  
**TWEEN80**



ASSESSOR	C.G. FIG.	
BY	CLASS	SUBCLASS
DRAFTSMAN		

## FIG. 24A

NaCl



## FIG. 24B

TEMPERATURE

